Abstract

Banknote Validator

A banknote validator includes magnetic and optical sensors (305, 306, 307) and a non-return gate in its banknote path (80).

The magnetic sensor (307) comprises a magnetic circuit and an electronic circuit. The magnetic circuit comprising a yoke (402) and two giant magneto-resistors (400, 401) and the electronic circuit comprises a coil (407) arranged to generate a magnetic field in the yoke (402) and first and second feedback control loops. The first loop is responsive to the output of the first giant magneto-resistor (400) to energise the coil (407) so that the giant magneto-resistor operates in a predetermined region of its characteristic. The second loop is responsive to the differential between the giant-magneto-resistor outputs to generate a bias voltage for the second giant-magneto-resistor (401) tending to cause the differential to be zero.

The optical sensor (305, 306) comprises a trapezial light guide (33, 104), a broadband light source (350) for illuminating a banknote via the light guide (33, 104) and sensors (351, 352, 353) for detecting light reflected from the banknote via the light guide (33, 104). Filters (354, 355, 356) are arranged in front of the sensors (351, 352, 353). The light guide (33, 104) is inclined relative to the banknote path (6).

The non-return gate (80) does not need to be actively driven but falls when a banknote has passed and, when the banknote's direction of travel is reversed, guides the banknote along an accept path. If the banknote has not fully passed the non-return gate (80) when its direction is reversed, it is driven back to the validator's note insertion slot.